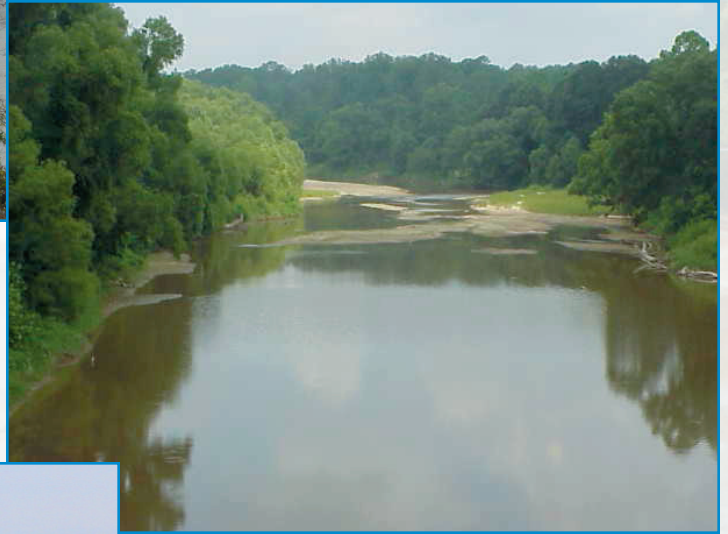


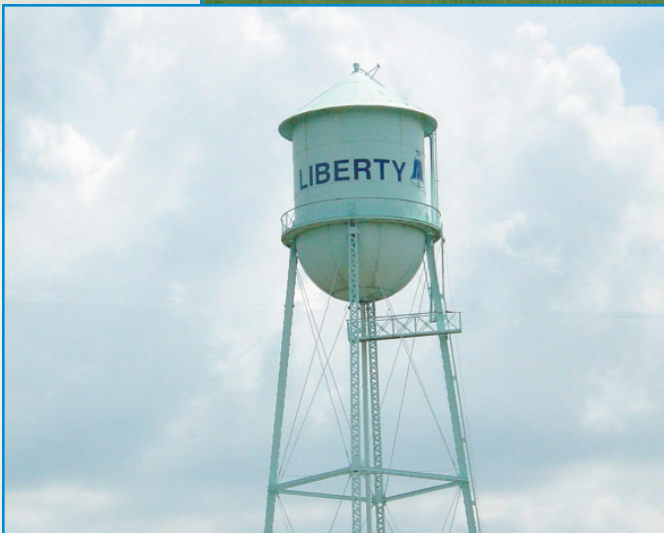
# South Independent Streams Basin



## Status Report



2000



#### Cover Photographs:

The upper left cover photo was taken from the east bank of the lower Mississippi River in Vicksburg. The South Independent Streams basin includes areas of the Mississippi River below the City of Vicksburg.

The upper right cover shows Bayou Pierre in Claiborne County. Other major waterways in the basin include the Homochitto River, Buffalo River, Tangipahoa River and the East and West Amite Rivers.

The center left cover photo shows cattle grazing near a small pond in southern Hinds County. Agricultural and forested areas comprise most of the basin's land cover and can impact water quality.

The lower left cover photo shows a ground water storage tank in the town of Liberty. Most of the basin residents have access to one of the 178 large-capacity wells in the 11 basin counties.

The lower right cover illustration depicts the boundary of the South Independent Streams Basin, as well as county lines, major roads, major streams and lakes in the basin.

## ACKNOWLEDGMENTS

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This document is a product of the South Independent Streams Basin Team, which consists of representatives from twenty-two agencies, and was developed under the leadership of the Basin Management Approach staff of the Mississippi Department of Environmental Quality (MDEQ). The South Independent Streams Basin Team consists of the following resource agency partners:

### State of Mississippi and Local Agencies

Agriculture and Commerce (MDAC)

Agricultural and Forestry Experiment Station (MAFES)

Development Authority (MDA)

Emergency Management Agency (MEMA)

Environmental Quality (MDEQ)

Forestry Commission (MFC)

Health (MSDH)

Institute of Higher Learning (IHL/MARIS)

Marine Resources (MDMR).

Mississippi Army National Guard (MSANG)

MSU Cooperative Extension Service (MSU/CES)

MSU Water Resources Research Institute (WRRI)

Pearl River Basin Development District (PRBDD)

Soil and Water Conservation Commission (MSWCC)

Transportation (MDOT)

Wildlife, Fisheries, and Parks (MDWFP)

### United States Government Agencies

Army Corps of Engineers, Vicksburg District (USACOE)

Environmental Protection Agency (Region IV)

Fish and Wildlife Service (USFWS)

Forest Service (USDA/USFS)

Geological Survey (USGS)

Natural Resources Conservation Service (USDA/NRCS)

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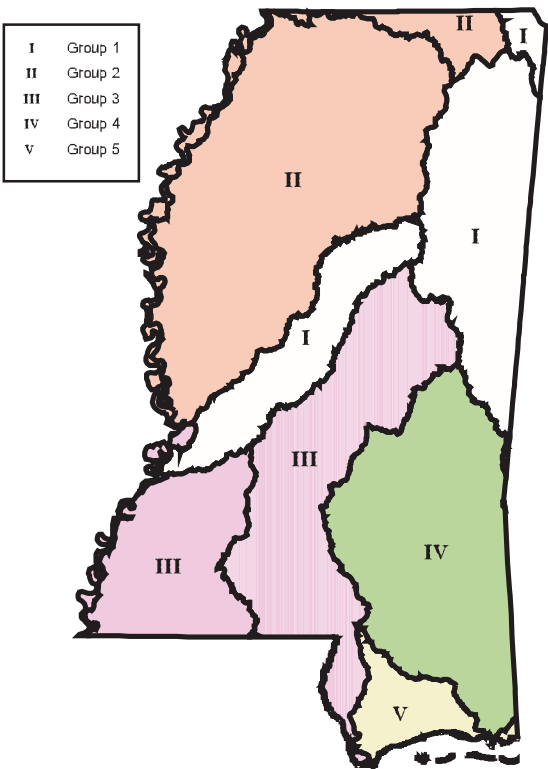
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# INTRODUCTION

## What Is The South Independent Streams Basin Status Report?

Mississippi Department of Environmental Quality (MDEQ) manages its water programs on a basinwide scale and has established a process that coordinates the water assessment and management activities of numerous state and federal agencies. This process, the Mississippi Basin Approach to Water Quality Management, will culminate with the development of basin management plans for each of Mississippi’s major river basins (Figure 1). The development of each of the basin management plans will be carried out in 5 successive phases, referred to as the Basin Management Cycle - Planning, Data Gathering, Data Evaluation, Management Plan Development, and Implementation (Figure 2). An early activity under the planning phase of the Basin Management Cycle is the preparation of a Basin Status Report. This document provides an overview of the South Independent Streams Basin and adjacent tributaries of the Lower Mississippi River, describes the basin’s current water quality conditions, and identifies current assessment and management activities within the basin.



**Figure 1.** Basin Management Groups under the Mississippi Basin Approach to Water Quality Management (MDEQ)

## What’s Inside

After this introduction, the report is divided into three major sections. Each section builds on the previous one to explain the condition of water resources within the South Independent Streams Basin. The *first section* provides an overall description of the basin and its major features, including hydrology, land use characteristics, and biological features.

The *second section* summarizes how water quality in Mississippi is assessed and describes the current data collection efforts and research programs that are occurring within the basin. The status of water quality conditions in the basin for ground water and surface water is reviewed. This section also identifies some of the activities that may affect the water quality in the basin. Additional management needs that are already known and future steps in the basin management cycle are discussed.

The *third section* provides information on the current management programs that are used to assess and improve water quality conditions in the basin.

Basin Groups and Cycle Year		
Group	Basin	Year Started
I	Big Black, Tombigbee, and Tennessee River Basins	1998
II	Yazoo River and North Independent Streams Basins, and adjacent tributaries of the Mississippi River	1999
III	Pearl River and South Independent Streams Basins, and adjacent tributaries of the Mississippi River	2000
IV	Pascagoula River Basin	2001
V	Coastal Streams Basin	2002

# INTRODUCTION

## Who Should Read This Document

Everyone in the basin—from families living off the land to large and small business owners—can use the information in this report to better understand the current conditions of water resources in the basin, as well as activities designed to protect those resources. Local government officials can use this report to find out about water resource assistance programs. State and federal agencies can use the report to learn about existing data collection activities within the basin.

Individuals and local organizations can use the report to identify potential causes of water quality problems in their community and learn how to get involved in local watershed protection activities. The purpose of Mississippi's Basin Management Approach is to restore and protect the quality of the State's water resources by developing and implementing effective management strategies that address water quality issues while supporting wise economic development. The process will culminate in the development and implementation of a basin management plan designed to address priority water resource problems in the basin. This status report is an early product of the process.

## How The Status Report Relates To Other Basin Planning Activities

Mississippi's Basin Approach to Water Quality Management, or Basin Management Approach, is an effort led by MDEQ to facilitate comprehensive water quality planning and to foster the implementation of practices that will result in water protection on a basinwide scale. This approach recognizes the interdependence of various water quality management activities by numerous state and federal agencies that routinely occur within the basin.



Team members from state, federal, and local agencies work on water quality issues of the South Independent Streams and Pearl River Basin.

These activities include monitoring, assessment, problem identification and prioritization, planning, permitting, and implementation of best management practices. The goals of the Basin Management Approach are the coordination of these activities and the integration of information on a basinwide scale that will serve to better focus water quality protection efforts.

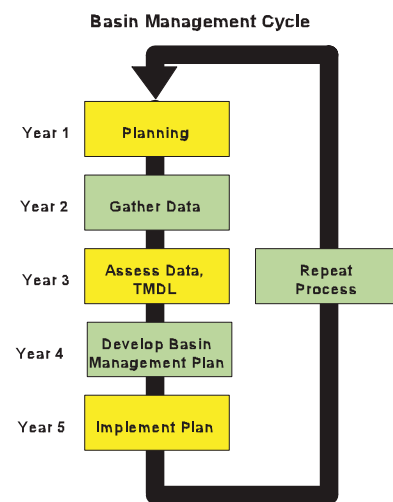


Figure 2. Basin Management Cycle (MDEQ)

The progression of water quality management activities in the basin will be based on a repeating five-year management cycle. During Year 1 of the Basin Management Cycle, water quality-related issues of concern in the basin are identified and prioritized, a Basin Status Report is prepared, and a Data Collection Plan is developed that concentrates on assessment of the priority issues of concern. During Year 2, the Data Collection Plan is implemented and existing data sources are identified. Year 3 activities focus on the interpretation of information identified and collected, as well as coordination with development of Total Maximum Daily Loads (TMDLs). Year 4 addresses the development of a basin management plan and action strategy to address priority issues. Implementation of the management plan is the objective of Year 5.

# SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION

## Where Is The South Independent Streams Basin?

The South Independent Streams Basin is located in southwest Mississippi and consists of those streams which drain into the Mississippi River below the Big Black River and streams which drain into Louisiana, west of the Pearl River Basin. This 4,418 square mile area comprises all or part of 11 counties in southwestern Mississippi (Figure 3). Major streams in the basin include the Homochitto River, Bayou Pierre, the Tangipahoa River and the east and west forks of the Amite River.



Figure 3. South Independent Streams Basin (MDEQ)

### SOUTH INDEPENDENT STREAMS Basin Statistics

Area: ~ 4418 square miles  
Number of Counties: 11  
Number of Sub-basins: 9  
2000 Census Population: ~ 483,835  
(Total population of 11 basin counties)  
Major Land Use: Forestry

## The Historical Background Of The Basin

Every prehistoric and historic group that has entered this area has utilized the South Independent Streams Basin. Since 6,000 B.C., the South Independent Streams Basin was well traveled, hunted, and fished by native groups. When Europeans first arrived, three major Indian groups were living in Mississippi: Choctaw, Chickasaws, and Natchez. The Natchez Indians, numbering about

6,000, lived in nine villages along St. Catherine's Creek near the present city of Natchez. Historic occupations, beginning with the French in the early 1700s and continuing to the present, took advantage of the area's resources and settled throughout the Lower Mississippi River Basin.

Streams within the South Independent Streams Basin carried a adequate amount of water that was used for irrigation and livestock. None of the streams were used as routes for moving goods, except for some commerce moving along the Homochitto River. The lack of navigable waterways kept the basin from developing a large population.

## What Are The Water Resources In The Basin?

**Surface Water.** The South Independent Streams basin contains 9 major sub-basins (Figure 4), which represent drainage areas for major rivers (delineation by sub-basins provides useful boundaries for planning, assessment, and management activities). Most streams in this basin have good flow, clear water, and sandy stream bottoms. In general, the streams are of fair to good water quality, especially those streams that flow through the Homochitto National Forest.



Figure 4. Sub-basins of the South Independent Streams Basin (MDEQ)

## SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION

South Independent Streams Sub-basins		
Sub-basin	Hydrologic Unit	Area (mi <sup>2</sup> )
MS River Below Vicksburg	08060100	367
Bayou Pierre	08060203	1076
Coles Creek	08060204	537
Homochitto River	08060205	1225
Buffalo River	08060206	348
Bayou Sara	08070201	167
Amite River	08070202	580
Tickfaw	08070203	67
Tangipahoa River	08070205	260

According to the *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters*, the majority of the waters in the South Independent Streams Basin are classified as Fish and Wildlife streams. Waters in this classification are intended for fishing and the propagation of fish, aquatic life and wildlife, and are also intended for secondary contact recreation (e.g. incidental contact with the water, including wading and occasional swimming). In addition to the Fish and Wildlife Classification, several lakes in the basin (Clear Springs Lake and Percy Quinn Lake) along with portions of Bayou Pierre and Little Bayou Pierre, the east and west forks of the Amite River and the Homochitto River are

classified for Recreation. Waters in this classification are intended for such water contact activities as swimming and water skiing.

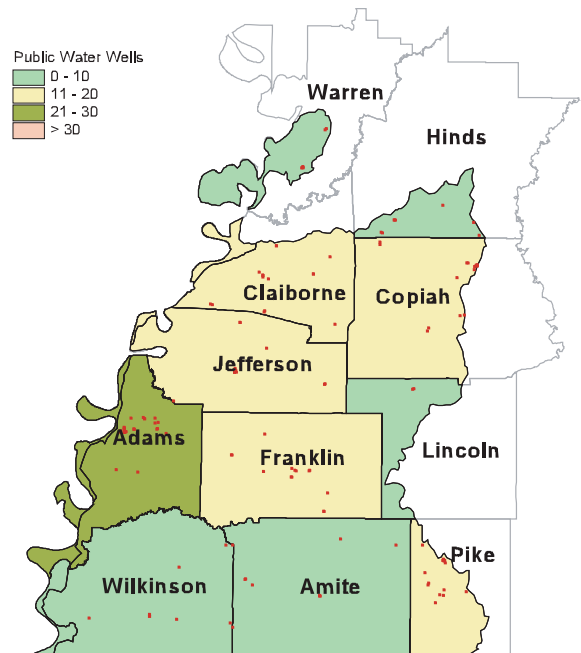
**Ground Water Aquifers.** This region of the state is dominated by Miocene-aged sands and clays that crop out at the surface before dipping primarily to the south beneath the land surface. The characteristically discontinuous nature of these sediments often results in the complex hydrogeology typically associated with the Miocene aquifer system (i.e., Catahoula, Pascagoula, and Hattiesburg formations). Most of the public water system wells in the region utilize deep confined sands (aquifers) included in the Miocene aquifer system. The Citronelle aquifer mostly furnishes water for private domestic use throughout the region. Access to the prolific Mississippi



Ground Water Storage Tank in rural community near Port Gibson.



Large volume of water from the Mississippi River Valley alluvial aquifer is used in the daily operation of the Grand Gulf Nuclear Power Station (Claiborne County).



**Figure 5.** Number and Locations of Public Water Supply Wells by County in the South Independent Streams Basin (MDEQ 1999)

## SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION

River Valley alluvial aquifer along the western boundary of the region allows for the large volumes of water to be pumped in Adams and Claiborne Counties.

### The Importance Of Ground Water

As in most of Mississippi, ground water is predominately used through out the South Independent Streams Basin for a variety of purposes. Although private domestic wells remain widely used throughout the rural areas, most of the area's inhabitants have access to the 55 public water systems that operate 178 large-capacity wells in the counties included wholly or partially within the region (Figure 5). Approximately 60 million gallons of ground water are withdrawn each day for potable water supply in the region. Other significant ground water uses in the region include more than 30 million gallons per day (MGD) for thermoelectric power generation in Claiborne County and approximately 42 MGD for industrial purposes in Adams County.

### The Importance Of Wetlands

Swamps, marshes, bogs and bottomland hardwood forests are known collectively as wetlands. Only twelve states have more than Mississippi's approximately four million acres of wetlands. Many people think of wetlands as places that breed mosquitoes, harbor snakes and make water quality bad. However, due to their natural position between dry land and open water, wetlands intercept surface water runoff. Thus, wetlands are an efficient and cost-effective way to control nonpoint source pollution. For instance, runoff from agricultural land may put excess nitrogen and phosphorus (the components of fertilizers) into rivers and streams. Wetlands can absorb these

nutrients as well as return some of the nitrogen back to the atmosphere. They can also filter sediment from surface water runoff. Consequently, pollutants attached to the sediment are also removed from surface waters. Wetlands also recharge aquifers, attenuate flooding and help to control erosion.

In addition to their ability to enhance water quality, wetlands are among Mississippi's most productive habitats, providing diverse habitats for a variety of mammals, birds, reptiles, amphibians and fish. Nearly one-third of the nation's endangered and threatened species live in or are dependent on wetland habitats. In addition, millions of waterfowl use them for breeding and wintering grounds every year.

Because of their benefits and important functions, the protection of wetlands in Mississippi is important. Authorization is required for any activities that will result in the discharge of dredged or fill material into waters of the state, including wetlands. The Vicksburg District of the US Army Corps of Engineers district office can help identify whether wetlands are on your property and advise you whether a proposed activity will require a permit. The Natural Resources Conservation Service can supply the same information for planned agricultural activities.

### Where People Live In The Basin

The population for the counties within the South Independent Streams Basin was estimated in 2000 at 439,933. This is a 3% increase since 1990 (Figure 6).



Wetlands are among Mississippi's most productive habitats, providing diverse habitats for a variety of mammals, birds, reptiles, amphibians and fish (St. Catherine's Creek).

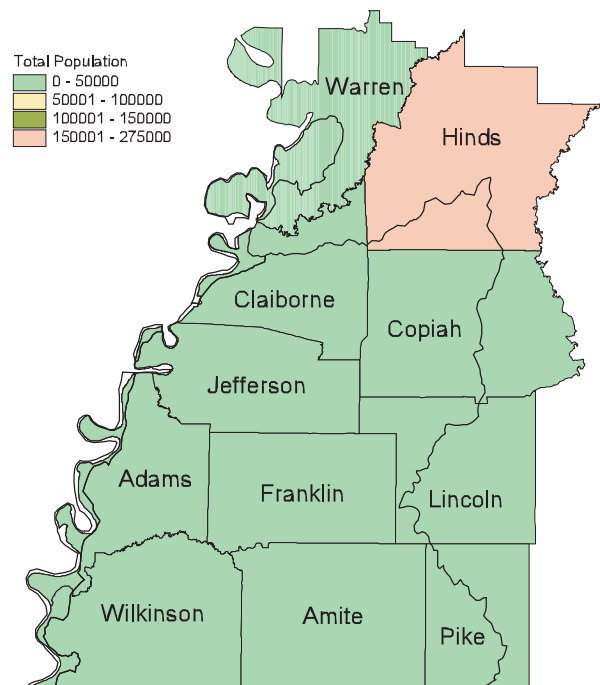


Figure 6. 1990 Population by County (US Census Bureau)

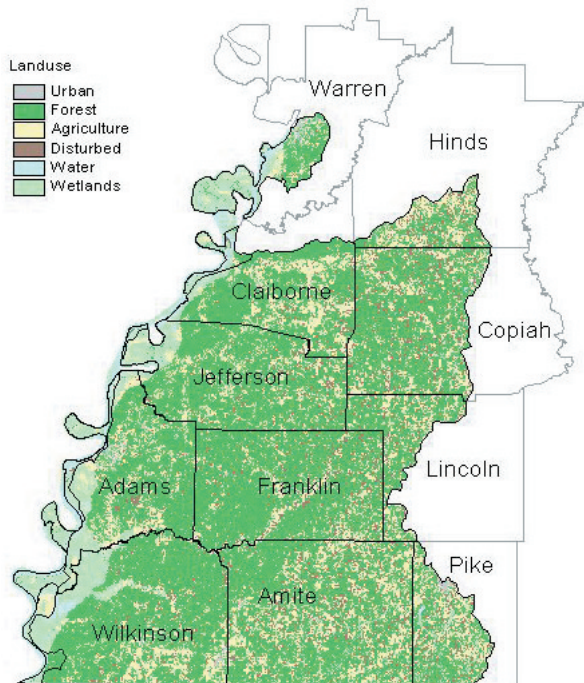
## SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION

South Independent Streams Basin Area Population				
County	1990	2000	Change 1990-2000	
			# People	%
Adams	35,356	34,340	-1,016	-3
Amite	13,328	13,599	271	2
Claiborne	11,370	11,831	461	4
Copiah	27,592	28,757	1,165	4
Franklin	8,377	8,448	71	1
Hinds	254,441	250,800	-3,641	-1
Jefferson	8,653	9,740	1,087	11
Lincoln	30,278	33,166	2,888	10
Pike	36,882	38,940	2,058	6
Warren	47,880	49,644	1,764	4
Wilkinson	9,678	10,312	634	6
<b>Totals</b>				
Mississippi	2,573,216	2,844,658	271,442	10
SI Basin	483,835	489,577	5,742	1

County Population (US Census)

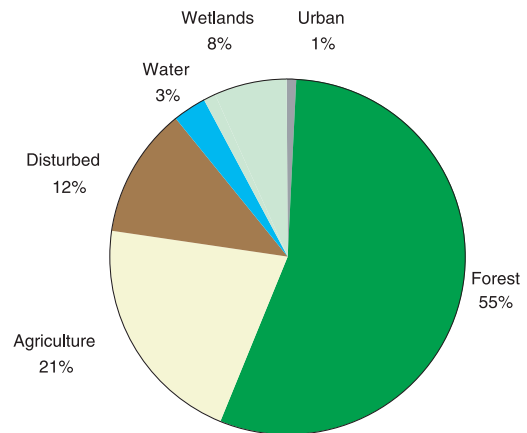
### How Land Is Used In The Basin

The principal land uses in the South Independent Streams Basin are agriculture and silviculture with some concentrated areas of industry around the cities of Natchez, Brookhaven, and McComb.



**Figure 7.** Major Land Cover in the South Independent Streams Basin (MARIS)

Overall, land cover is dominated by natural *Forest* (55%), which includes evergreen, deciduous and mixed-forested areas. *Agricultural* area comprises the next largest portion (21%) and includes croplands and pastures. *Disturbed* areas that include strip mines, gravel pits, sandy areas, barren, and transitional areas make up 12% of the basin. *Wetlands*, which includes forested and nonforested wetlands, palustrine, lacustrine and riverine areas, make up 8% of the land cover. Despite their potential environmental impact, *Urban* areas make up only 1% of the land cover of the basin (Figure 8). *Water* sources, which include streams and lakes make up the remaining 3% of land cover.



**Figure 8.** Distribution of Land Cover in the South Independent Streams Basin (MARIS)

### How Land Uses Impact Water Quality

Many anthropogenic or human influenced activities that could potentially affect water quality routinely occur in the basin. These activities include forestry, agriculture, livestock operations, urbanization, mining operations, direct discharge of pollutants from industrial or wastewater facilities, solid waste management and oil and gas exploration.

**Forestry.** The primary land use in the South Independent Streams Basin is forestry. Amite County leads the state in forestry production and is 14th in the nation. Our forests are essential to clean water. Forested land absorbs rain, refills underground aquifers, cools and cleanses water, slows storm runoff, reduces flooding, sustains watershed stability and resilience, and provides critical habitat for fish and wildlife. Forestry provides a solution to water quality issues. Non-point source (NPS) pollution can be reduced by improving forest cover on depleted forest lands, rapidly reforesting abandoned lands, and reestablishing and maintaining riparian forests on the edge of streams.

## SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION



Crop of pine trees in Covich County.

Though forest management is vital to the protection of our water resources, forestry activities can contribute to impairment of rivers and streams. The principal NPS pollution impairment concern regarding forestry is sedimentation. Sediment runoff from forest roads, skid trails, and other forest activities which result in exposure of mineral soil, can result in impairment of nearby water bodies. Timber harvesting activities are typically infrequent, carried out over short periods of time and results in only short-term impacts when compared with other NPS categories. Best Management Practices (BMPs) have been designed and are being implemented statewide to address NPS pollution from forestry activities. When proper management practices are not used, potential water quality impacts from erosion and sediment runoff can be significant.



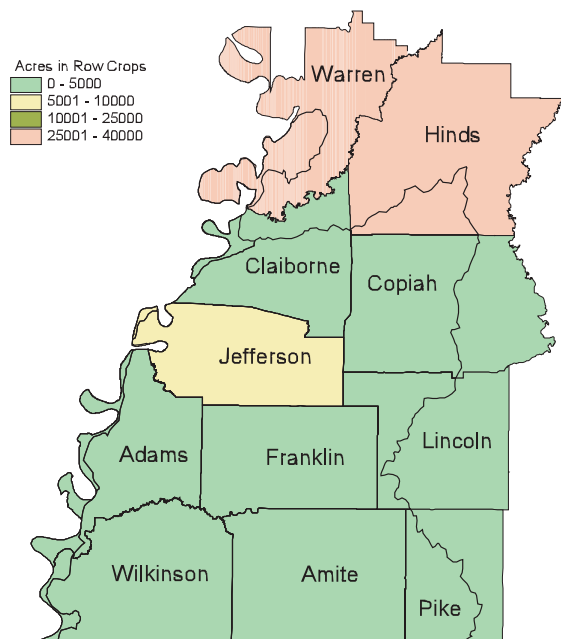
When proper management practices are not used, potential water quality impacts from erosion and sediment runoff can be significant.

**Agriculture.** Crops are produced on a relatively small percentage of the basin's total land area. Agricultural commodities produced in the basin include dairy cows, cattle and calves, forage crops, poultry and row crops such as corn and soybeans. In 1998, an estimated 13,800 acres of corn, 15,200 acres of soybeans, and 4,500 acres of wheat were produced in counties that are a part of the basin (Figure 9).



Corn field in Claiborne County.

Where proper management practices are not used, sediment, nutrients (e.g., nitrogen and phosphorus from fertilizers), and pesticides can be transported from cropland into surface waters. Collectively, the predominant non-agricultural nature of the basin and the use of best management practices by farmers have helped to mitigate local water quality concerns and support the generally fair to good water quality prevalent in the basin.



**Figure 9.** Acres of Row Crop Production by County (USDA 1999)

# SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION

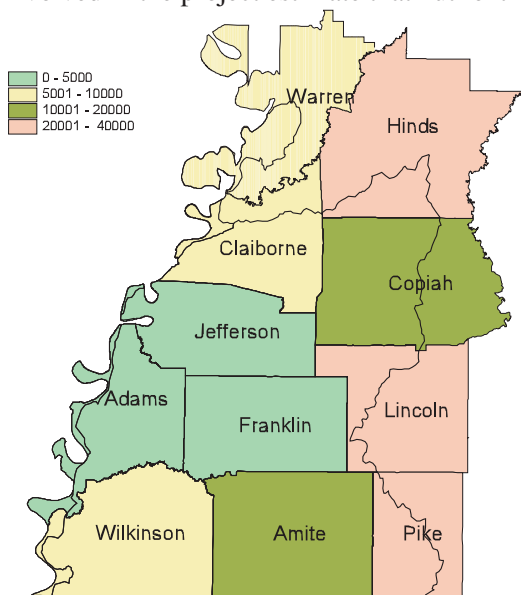
**Livestock Operation.** According to the Mississippi Agricultural Statistics Service (1998), an estimated 115,600 cattle and calves, 57,700 beef cattle and 8,100 dairy cows are produced in and around the basin. Beef cattle are produced in all counties included in the basin, but production is of a non-concentrated nature (Figure 10).



Dairy cattle grazing in Amite County.

While dairy cows are produced in a more limited number of counties within the basin, the number of dairy operations continues to decline by more than 40% in recent years.

In addition, programs administered by state and federal agencies have helped reduce impairments to water resources. As an example, the Tangipahoa Hydrologic Unit Area (HUA) project, a special water quality improvement program aimed at dairy producers, was administered in parts of three counties located within the South Independent Streams Basin in the 1990s. As part of this project, new waste management facilities were installed or existing facilities renovated on many farms in the project area. Field days and other education programs also were conducted to encourage practices that protect and preserve water quality. Agencies involved in the project estimate that nutrient



**Figure 10.** Number of Livestock Operations by County (USDA 1999)

loadings within the HUA were reduced by 28 percent as a result of new and improved livestock waste management facilities and other agricultural best management practices. These programs, combined with a continuing decline in the number of dairy operations, have helped reduce potential water quality impairments in the basin.

**Urban Non-point Source Runoff.** Urban areas contribute nonpoint source pollution (pollution that comes mainly from stormwater runoff that picks up pollutants over an area and washes them into nearby streams and lakes) in three main ways. First, stormwater runoff carries sediment from construction sites. This sediment is then washed into storm drains and drainage ways where it is carried to nearby streams. Increased amounts of sediment cause various problems such as blocked storm drains, silted up streams and lakes, and degraded fish habitat.



Sediment from construction sites can be easily washed into storm drains and other drainage ways (city of Natchez).

The second contribution of nonpoint source pollution from urban areas is the pollutants from established areas that are picked up by stormwater and washed into nearby streams. These pollutants include pesticides and fertilizers from lawns, oil and greases and heavy metals from roads and parking lots and litter.

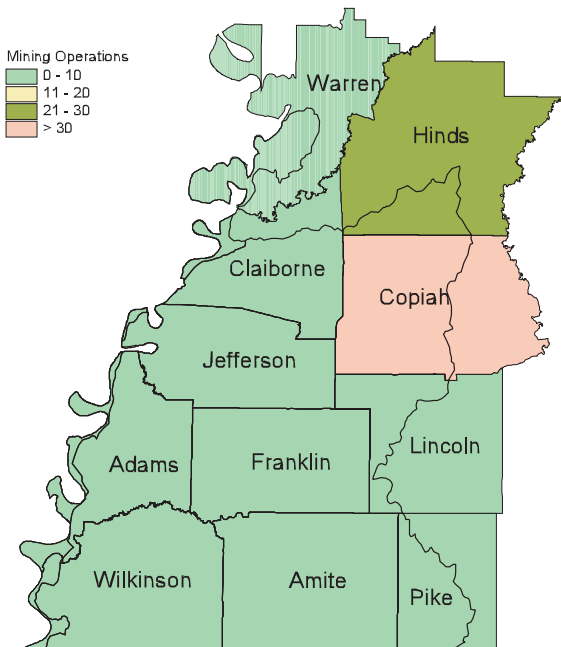


In the past the runoff soaked into the ground or was absorbed by plants. Now, with more impervious surface, runoff can flow straight into the nearest stream or river (Hinds County).

## SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION

The third contribution, and perhaps the most damaging to aquatic habitat, is the increasing amount of stormwater from growing urban areas that flows into streams. As an urban area grows, more and more of the land surface in a watershed is made impervious (parking lots, roads, and sidewalks, etc.). Where in the past the runoff soaked into the ground or was absorbed by plants, now the runoff flows straight to the nearest stream. In other words, more water flows more quickly into streams causing increased flooding and habitat loss as the stream channel erodes in order to handle the increased flow.

**Mining Operations.** The mining of sand and gravel can cause major local changes to the earth's surface and has the potential to greatly affect surface water quality and flow patterns. These effects become a major concern when the mining activity is taking place immediately adjacent to a stream or in the streambed. Surface mining disturbs original topography, vegetation, and often the flow patterns of nearby streams and creeks. Potential water quality impacts include increases in sediment and metals, as well as changes in pH. There are at least 209 mining operations in the South Independent Streams Basin. This number does not include "grandfathered" mines, which were in existence before April 1978, when the Mississippi Surface Mining and Reclamation Act (1977) went into effect. Materials being mined include dirt, sand, gravel, brick clay, and topping material.



**Figure 11.** Number of Permitted Mining Operations by County (MDEQ 2001)

The Mississippi Surface Mining and Reclamation Act requires that all mining operations of more than four (4) acres in size or closer than 1,320 feet to another operation, regardless of size, be permitted by the state (Figure 11). The operator is required to file a schedule and plan for reclaiming the site when the mining is completed. A

performance bond is required of the operator to insure that the work will be done, should the operator be unable or unwilling to reclaim the site. Such operations are inspected on an annual basis, or more often if needed, to insure that erosion, sediment and pollution are confined to only the permitted area.



Surface mining operation in Adams County. Potential water quality impacts from surface mining operations include increases in sediment and metals, as well as changes in pH.

Operations that affect less than four (4) acres and are greater than 1,320 feet from another operation are not required to be permitted or reclaimed, nor are any operations, regardless of size, in place prior to April 15, 1978. Operators or landowners, however, are held responsible for any effects outside of these otherwise "exempt" areas.

As previously stated, mining operations can affect surface water and stormwater patterns. As such, the Mississippi Wastewater Regulations require all mining sites that discharge stormwater, regardless of size, to obtain a stormwater permit. As part of the application process, the applicant will need to prepare and submit a Stormwater Pollution Prevention Plan (SWPPP). Guidance documents for preparing a SWPPP for individual sites are available at the Environmental Permits Division of MDEQ's Office of Pollution Control.

Mining activities that result in a discharge of dredged or fill material into waters of the State, which includes intermittent and perennial streams as well as wetlands, may require additional permits. These permits may include a Section 401 Water Quality Certification from MDEQ and a Section 404 permit from the U.S. Army Corps of Engineers. The mining activities must meet a specific set of criteria set forth in the Mississippi Wastewater Regulations prior to the issuance of a Section 401 Water Quality Certification.

Mining in streambeds is a major concern of the Mining and Reclamation Division of MDEQ's Office of Geology. If certain guidelines are not followed, such mining may lead to what is called "headward erosion" or "headcutting" of the streambed. The water in the upstream beds, along

## SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION

with the adjacent banks, has a tendency to flow into the excavation. This activity destroys the natural banks by cutting the bed downward (headcutting) and then widening the channel. Moreover, such erosion has a tendency to progress upstream and change the stream characteristic miles from the initial excavation. Streambed instability and bank failure, resulting from the moving headcuts, can impact water quality, aquatic life, and the stability of bridges. As directed by the Commission on Environmental Quality, the Mining and Reclamation Division discourages mining in streams. The Division can either refuse to permit or call for a “Cease and Desist” order if it deems that a given operation may damage or is damaging to a stream system.



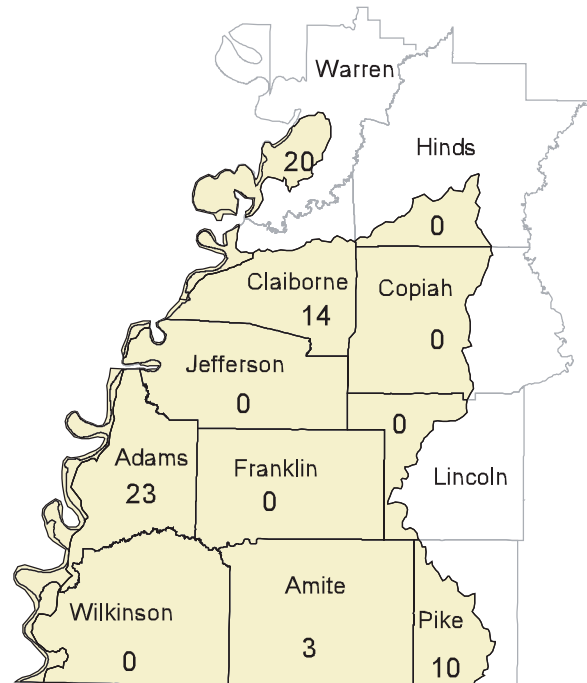
Before headcuts (left) and after headcuts (right) in Wells Creek (Franklin County). As the right photo indicates, unchecked headcuts leave the stream areas much wider and shallower.

**NPDES Permitted Dischargers.** A National Pollutant Discharge Elimination System (NPDES) permit is issued to any facility discharging treated wastewater to state waters. These permits specify the types, quantity, and concentrations of pollutants that may be discharged. Facilities receiving NPDES permits include industrial dischargers, municipal sewage dischargers, and commercial/private dischargers.



Facilities receiving NPDES permits include industrial dischargers, municipal sewage dischargers, and commercial/private dischargers.

**Industrial Dischargers.** Approximately 70 industrial point source dischargers are permitted in the basin (Figure 12). Several types of industries are represented by these dischargers, including timber products; energy production; and chemical, agricultural, metal manufacturing and other miscellaneous industries.

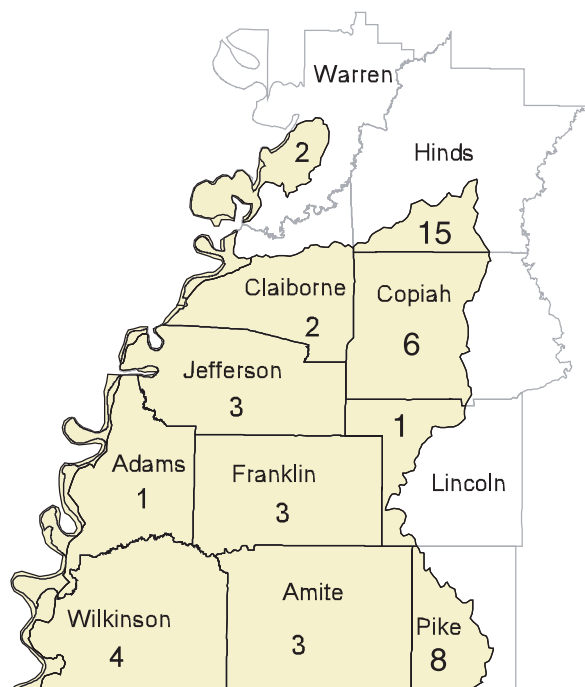


**Figure 12.** Number of Permitted Industrial Dischargers by County (MDEQ 1999)

**Municipal Dischargers.** Where people live and work, they must have a way to collect and treat their sewage. The South Independent Streams Basin has at least 48 permitted municipal sewage dischargers (Figure 13). Included in the Basin are 137 organized or unincorporated communities. Twenty-six of these are incorporated communities. One hundred eleven are unincorporated communities. Of the 26 incorporated communities, all have centralized wastewater collection and treatment facilities (CWTF), including one major discharger (> 1.0 MGD). There are 108 organized communities without centralized collection and treatment facilities.

Of these 108 communities without centralized collection and treatment facilities, 16 clearly need such facilities and 12 do not. The Basin Team has no data on the other 80 communities in the basin.

## SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION



**Figure 13.** Number of Permitted Municipal Sewage Dischargers by County (MDEQ 1999)

Of the 29 communities with central collection and treatment facilities, 13 need treatment plant upgrades, 10 need to remove excessive infiltration/inflow from their systems, and 9 need to expand their collection systems.

Communities without central sewage collection and treatment are assumed to use individual residential onsite wastewater treatment systems. Such systems include septic tanks or small package treatment systems. Individual treatment systems should also be in use in rural areas in the basin. When such systems are not used, not maintained or are used in unsuitable soils, contamination of ground water, or surface water is probable, and public health concerns will exist.

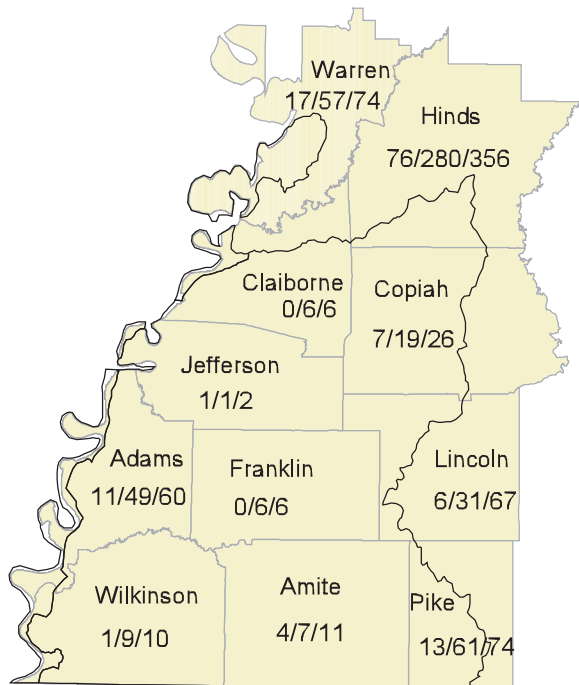
**Commercial/Private Dischargers.** Numerous other facilities exist in the basin that discharge wastewater, but are not classified as industrial or municipal dischargers. These commercial and private dischargers include schools, trailer parks, and residential subdivisions. Typically, these facilities do not individually discharge the large volumes of treated wastewater as industrial and municipal facilities.

**Hazardous Waste Operations.** Numerous uncontrolled hazardous substance sites throughout the South Independent Streams Basin pose potential localized threats to human health and the environment through releases to the soil, sediment, or groundwater. An uncontrolled site is a facility or location where hazardous or toxic substances have been released into the environment and where no federal environmental program exists to handle the problem. These sites have been contaminated by leaking chemical tanks (both above and below ground), abandoned landfills, and various chemical spills. The majority of the sites are found in those areas of the state that are highly industrialized. MDEQ has regulatory authority over all 63 sites in the basin. Four are being actively investigated by MDEQ or have remediation under way, and 5 have been remediated or determined to require no further action. Figure 14 shows the number of hazardous waste sites, requiring no further action, the number of active sites (those on which MDEQ is currently working), and the total number of sites within each county.

Municipal Dischargers			
Total Communities			137
Incorporated			26
	With Centralized WTF (CWTF)		26
	Without CWTF		0
	Major Dischargers >1.0 million gal/day		1
		Need Upgrades	13
		Need Expansion	9
		Excessive Infiltration	10
Unincorporated			111
	With CWTF		3
	Without CWTF		108
		Need CWTF	16
		Do Not Need CWTF	12

*Note - No data available on 80 communities*

## SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION



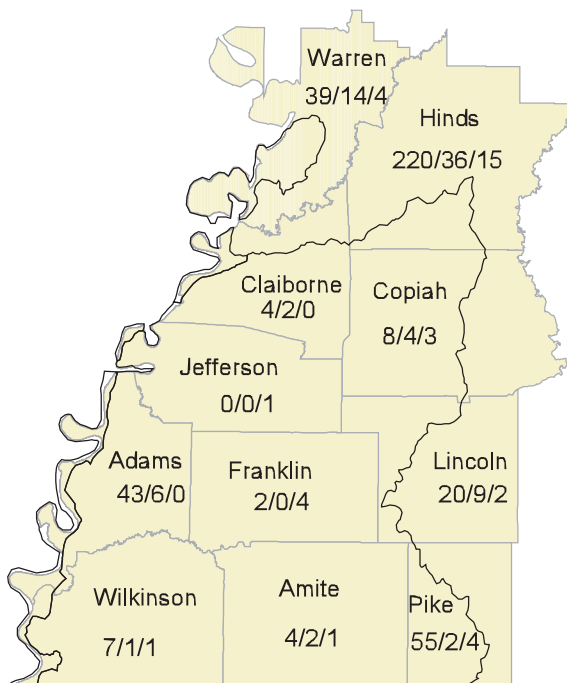
**Figure 14.** Number of Hazardous Waste Sites Requiring No Further Action/Number of Active Sites/Total Number of Sites by County (MDEQ 1999)

Additionally, there are 147 facilities within the basin that have notified MDEQ that they generate quantities of hazardous waste that require proper disposal. The hazardous waste generators are classified as either: 1)

Conditionally Exempt Small Quantity Generators (CESQG), who generate less than 220 pounds of hazardous waste in any given month during the year; 2) Small Quantity Generators (SQG), who generate between 220 pounds and 2200 pounds in any given month during the year; and 3) Large Quantity Generators (LQG), who generate greater than 2200 pounds in any given month during the year. Figure 15 shows the number of each of these generators in each county as CESQG\SQG\LQG.

**Solid Waste Management.** Solid wastes are garbage, refuse, and commercial and industrial nonhazardous wastes. In the past, state and federal guidelines on the disposal of solid wastes were not as stringent as they are now. As a result, older dumps and other sites where solid wastes were disposed may threaten ground and surface water resources in the basin. In recent years, however, new guidelines on siting and operating landfills have greatly reduced the risk of contamination from solid wastes.

Numerous solid waste management facilities exist throughout the South Independent Streams Basin. These facilities include municipal landfills (2), rubbish sites (7), land application facilities (2), transfer stations (3), waste tire collection sites (13) and industrial/special waste rubbish sites (2). In addition to the potential problems posed by older landfills, illegal random dumping of solid wastes also threatens to pollute ground and surface waters.



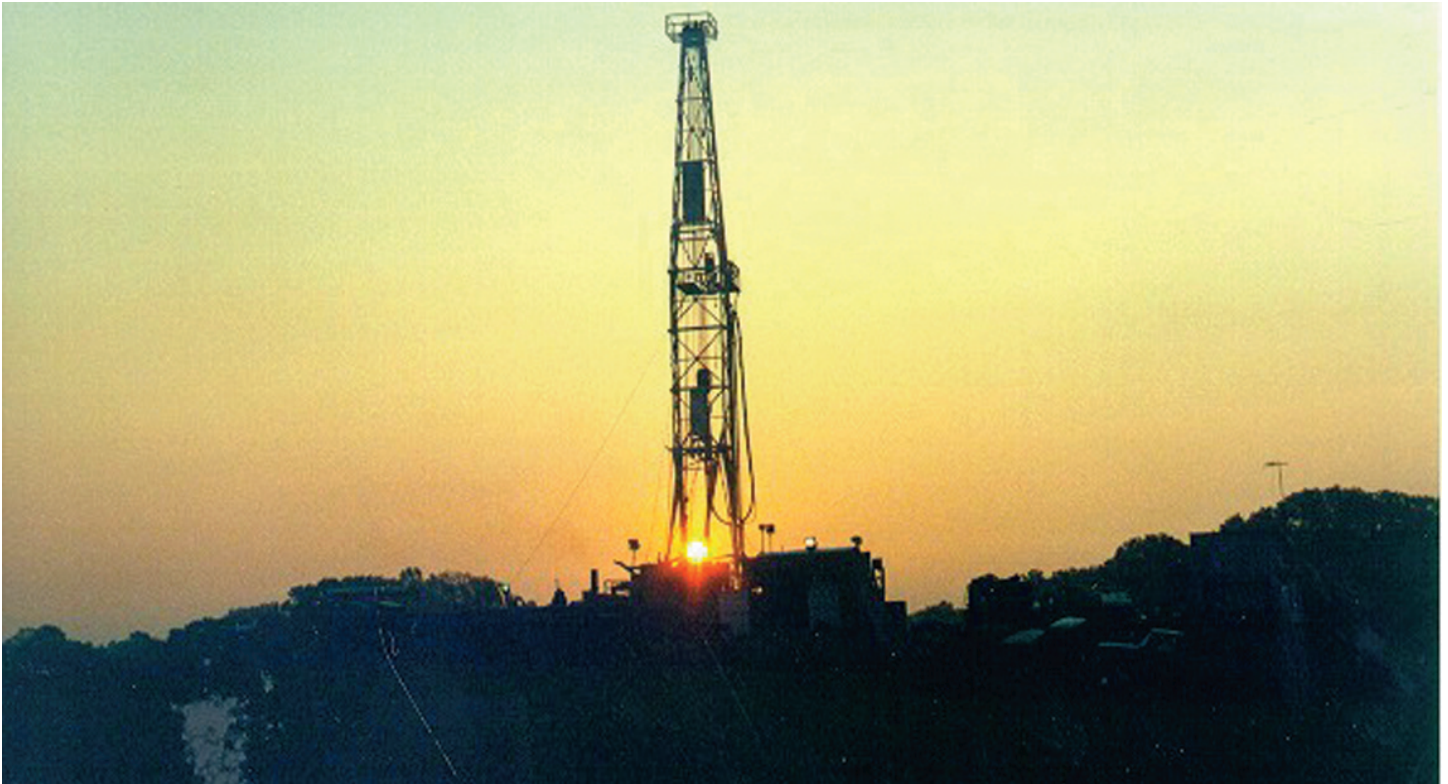
**Figure 15.** Number of Conditionally-Exempt Small Quantity Generators/Small Quantity Generators/Large Quantity Generators (MDEQ 1999)



Solid waste is dumped and compacted at a landfill in Adams County. Guidelines on siting and operating landfills have greatly reduced the risk of contamination from solid wastes.

## SOUTH INDEPENDENT STREAMS BASIN DESCRIPTION

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It is estimated that approximately one-third of the 27,000 plus wells drilled in Mississippi have been drilled in this part of the state.

**Oil And Gas Production.** Many people seem surprised to hear that Mississippi is a significant producer of oil and gas. It ranks 12th in oil production per year among the producing states and 16th in natural gas production per year. The Mississippi Oil and Gas Board's 1998 annual report shows that the state produced 21,304,763 barrels of oil and a little over 127 billion cubic feet of natural gas.

The South Independent Streams Basin includes some of the most important oil and gas producing counties in Mississippi and as a result also has large amounts of produced saltwater, which is associated primarily with the oil production. In 1999, according to the State Oil and Gas board, Mississippi's oil, saltwater, and gas production for the year was 18,074,185 barrels of oil, 230,633,761 barrels of saltwater and 125,719,794 million/cubic/feet (MCF) of gas. Of this, approximately 2,775,132 (14%) barrels of oil, 49,516,406 (20%) barrels of saltwater and 5,882,301 (5%) MCF of gas were produced in counties either partially or wholly in the South Independent Streams Basin.

Approximately 1,162 (27%) of the 4080 unplugged and producing oil and gas wells reported in 1999 are located within the confines of the South Independent Streams

Basin. It is estimated that approximately one-third of the 27,000 plus wells drilled in Mississippi have been drilled in this part of the state. A large number of these wells are located in the counties adjacent to the Mississippi River.

The depth of production ranges from in excess of 18,000 feet to less than 3,000 feet. Producing formations, from youngest to oldest, include: Frio, Sparta, Wilcox, Selma, Upper and Lower Tuscaloosa, Washita-Fredricksburg, Paluxy, Rodessa, Pine Island, Sligo, Hosston, and Cotton Valley.

One formation, in particular, has good future possibilities for becoming highly drilled because of future technologies. This formation is the Tuscaloosa Marine Shale, which contains a considerable volume of oil in place and extends over a large area in Amite, Franklin, Wilkinson and Pike counties.

The Mississippi Oil and Gas Board is the state agency charged with the majority of governmental oversight and regulatory authority when it comes to drilling and producing. Other agencies such as the Department of Environmental Quality also play a role in various aspects of the industry's activities.

# ASSESSMENT OF RESOURCES

## What Are Water Resource Assessments and How Are They Used?

Water resource assessments determine the quality of waterbodies within a basin. Are fish caught from a waterbody safe to eat? Is the water safe for swimming or to use to irrigate our food crops? Does the waterbody support healthy and diverse aquatic life?

The information collected in such an assessment is used to support sound decision-making by identifying good quality waterbodies and tracking their condition over time, to provide clues to the sources and levels of pollutants for waterbodies that are impaired or threatened, and to help managers understand the impacts of human activities within a watershed and the effectiveness of installed management practices.

**Designated Uses.** All waterbodies in the state are classified by MDEQ according to a primary designated use. Generally, certain water quality criteria are more stringent for the designated uses that are directly related to human health concerns (e.g., Drinking Water Supply and Recreation) than for those related to indirect human health concerns or other purposes. The purpose for the designated use is to provide a basis for establishing water quality standards for all of the waterbodies in the state.

Designated Uses of Mississippi Waters
1. Drinking Water Supply
2. Shellfish Harvesting
3. Primary Contact Recreation
4. Secondary Contact Recreation
5. Fishing and Fish Consumption
6. Aquatic Life Support

**Water Quality Criteria.** Water quality criteria are designed to protect the designated uses of waterbodies in the state. They are comprised of both numeric and narrative criteria. The numeric criteria consist of sets of parameter-specific requirements that, if violated, could potentially harm aquatic life and/or human health. As an example, to protect aquatic life, MDEQ has numeric criteria for minimal levels of dissolved oxygen. Also MDEQ has bacteria criteria to protect human health.



Monitoring Equipment Shed Used to Assess River Conditions.

Narrative criteria address more general conditions that may be detrimental to water quality but for which no actual numeric standard has been adopted. For assessment of the state's narrative water quality standards, screening or target levels for parameters, such as nutrients, are used as thresholds for potential water quality degradation and are compared against measured water quality data.

## What Are The Main Assessment Reports In The State?

A primary objective of the Mississippi Basin Management Approach is to coordinate the assessments of water quality for the basin's streams and lakes. Two of the main analysis efforts, the 305(b) Water Quality Assessment Report and the 303(d) List of Impaired Waterbodies, are prepared to meet requirements contained in the Clean Water Act.

**Section 305(b) Report.** Mississippi's biennial Water Quality Assessment Report is prepared by MDEQ pursuant to Section 305(b) of the Federal Clean Water Act. The purpose of the 305(b) Report is to describe for EPA, Congress, and the public the status of the quality of the state's waters. Along with water quality information, the report lists the causes and sources of pollution for those waters determined to be impaired, identifies and discusses water pollution control programs for point and nonpoint sources of pollution, documents environmental improvements for the previous two years, notes special water quality concerns and problems, and describes the state's water quality monitoring program.

The major focus of the report is to determine if the designated uses of the state's surface waterbodies are supported. Each designated use assessed for a waterbody is determined to be Fully Supported, Fully Supported But Threatened, Partially Supported, or Not Supported in accordance with its water quality standards. These determinations are based on the percentage of samples that exceed established water quality standards.

## ASSESSMENT OF RESOURCES

Determination of Support	
Support	% of Samples Exceeding Water Quality Standards
Fully Supported	≤10%
Partially Supported	11-25%
Not Supported	>25%

The Section 305(b) Report also includes recommendations for needed studies, programs, and funding to adequately manage Mississippi's water quality resources.

**Section 303(d) List.** Section 303(d) of the Clean Water Act requires the State to identify and list waterbody segments where water quality standards are not met and the designated use is impaired. Additionally, the State is required to establish a priority ranking system of the impaired waters (taking into account the severity of the pollution and the importance of the water's impaired use) and to develop total maximum daily loads for those pollutants impairing any use of the waterbody.

Because the list is biennial, the number of waterbodies listed changes, depending upon monitoring results. Water quality monitoring can result in a stream being listed, if impaired, or de-listed, if found not to be impaired.

**TMDLs.** Total maximum daily loads (TMDLs) are defined by EPA as written plans and analyses established to ensure that the waterbody will attain and maintain water quality standards. TMDLs contain calculations of the sum of the allowable loads, of a single pollutant, from all contributing point and nonpoint sources. The calculation must include a margin of safety and must account for seasonable variation in water quality, including consideration of reasonably foreseeable increases in pollutant loads. The TMDL should establish pollutant level reductions that will cause the impaired use to be fully supported.

### What are TMDLs?

$$\text{TMDLs} = \text{WLA} + \text{LA} + \text{MOS}$$

- Waste Load Allocations (WLA)  
(Point Sources)
- Load Allocation (LA)  
(Nonpoint Sources)
- Margin of Safety
- Plan to restore polluted streams



Datasonde Used To Collect In-Stream Water Quality Data

## What Are The Assessments Based Upon?

For water quality assessment purposes, all readily available water quality information is utilized in watershed assessments. The information is compiled and then categorized as one of two types of assessments, evaluated or monitored, based on the quality and quantity of the data available. These two types of assessments are necessary to provide a comprehensive assessment and understanding of water quality conditions and trends within an entire watershed.

*Evaluated* assessments focus on stream reaches where no current site specific monitoring data are available. These assessments take into consideration land use activities, surveys and questionnaires from other agencies, locations of potential pollution sources, volunteer monitoring data, limited monitoring data of lower confidence, monitoring data greater than five years old, and data that have been extrapolated from an adjacent monitored stream reach.

*Monitored* assessments focus on stream reaches where current site specific monitoring data are available. Current data are defined as data collected within five years of the assessment analysis. These assessments are based on one or more different types of monitoring data that have been grouped together by waterbody and then are analyzed collectively in order to determine water quality status or condition for the waterbody. Monitoring data can come in many different forms but primarily consist of one or more of the following data types: physical/chemical; biological; habitat; bacteriological; and/or toxicological.

## ASSESSMENT OF RESOURCES

MDEQ and other state, federal and local agencies have programs that routinely monitor the conditions of surface and ground waters to determine their quality and quantity relative to human health considerations, ecological conditions, and designated water uses. MDEQ also uses their data to assess the quality of the waterbody by comparing observed measurements to the State's water quality standards for the water's designated uses.

The Mississippi Department of Environmental Quality Office of Pollution Control (OPC) maintains a statewide fixed network of monitoring stations which are sampled routinely for a broad range of water quality parameters and indices. This is done in order to support the design and implementation of OPC's Surface Water Division water management programs including NPDES, nonpoint source, water quality standards, TMDL development, basin initiatives and water quality planning/management. Parametric coverage at the stations includes physical, chemical, bacteriological, biological, and/or fish tissue components. Currently, there are 5 primary fixed stations distributed throughout the South Independent Streams Basin. As the Basin process continues, a basin monitoring network will also be established. This will augment the statewide primary fixed station network by adding monitoring sites in specific drainage areas within the South Independent Streams Basin. In addition, flow information, which is key to the analysis and interpretation of water quality samples, will be monitored.

Common methods used to monitor water quality include fixed network routine ambient monitoring for long-term status and trends, as well as targeted basin monitoring to address specific data needs. Both of these monitoring methods are used to obtain water quality data on physical, chemical, bacteriological and biological indicators.

The concept of using biological indicators such as biodiversity to evaluate water quality is based upon the premise that healthy ecological systems should support diverse populations of many different types of organisms. Streams that are degraded due to poor water quality or habitat loss tend to have a population shift to more pollution-tolerant organisms and/or fewer species and, therefore, less biodiversity.

### What Are The Findings Of These Assessments?

**Observed Water Quality Condition.** Basin water quality can be measured directly or indirectly. Monitoring

of water quality, aquatic life, water quantity, and soils provides direct information on the water quality in a basin and the water's potential for affecting human health and aquatic life. MDEQ and other resource agencies monitor the condition of the surface and ground waters to determine their quality and quantity relative to human and ecological health. The following sections describe the condition of the South Independent Streams Basin's surface water, aquatic life, groundwater and soils based on recent monitoring.

**Surface Water Quality.** Most streams in this basin have good flow, clear water, and sandy stream bottoms. In general, the streams are of fair to good water quality, especially those streams that flow through the Homochitto National Forest.

MDEQ, in fulfilling Section 305(b) of the Clean Water Act, assesses Mississippi's current water quality conditions every two years. In 1998, MDEQ assessed (i.e. either directly from monitoring data or indirectly from land use information) approximately 46% of the state's surface waters. Only a small portion of the surface waters assessed in the South Independent Streams Basin were actually monitored (155 Miles). The remainder of the miles assessed (not monitored) was evaluated based primarily on land use. Principal sources of water quality problems in the basin are considered to originate from point sources and nonpoint source runoff. Stream water quality problems may result from one or more causes of pollution such as nutrients, siltation, organic material, pH, etc. Some tributaries in the basin, however, are impacted by chloride contamination from oil field activities and others experience localized problems with bacteria, which is transported as nonpoint source pollution from the land by runoff. The monitored streams are rated as good, fair, or poor in their support of healthy and diverse aquatic life. Ratings are made by comparing the water quality of the streams to regulatory standards or to high quality reference streams.



Monitoring of all basin waters, to verify water quality impacts, is currently on going by MDEQ and Resource Agencies.

## ASSESSMENT OF RESOURCES

Mississippi's 1998 303(d) List of Impaired Waterbodies identifies all of the waterbodies within the state that are considered to be impaired. Sources of data for this list include monitored and evaluated assessments from various water quality programs. Within the South Independent Basin, impairment has been established for monitored causes in 3 waterbody segments. Six TMDLs are planned for those waterbodies for the identified causes of impairment.

<b>Monitored Causes of Impairment for the South Independent Basin Lakes and Stream*</b>	
<b>Waterbody</b>	<b>Cause</b>
Lake Hazel	Nutrients
Lake Hazel	Oil and Grease
Lake Hazel	Organic Enrichment/Low DO
Lake Hazel	Sediment/Siltation
Lake Hazel	pH
Little Tangipahoa River	Unknown Toxicity

\* 6 monitored causes for 3 waterbody segments.

Fifty-three waterbody segments have been evaluated as being potentially impaired. These evaluated segments will be targeted for additional monitoring during the upcoming basin management cycle to verify actual water quality conditions.

<b>Evaluated Causes of Impairment for the South Independent Basin Streams and Lakes*</b>		
<b>Cause</b>	<b>Number</b>	<b>%</b>
Siltation	45	25
Nutrients	36	20
Pesticides	35	19
Organic Enrichment	31	17
Pathogens	23	13
Others	12	6
Total	182	100

\* 182 evaluated causes for 53 waterbody segments. Each waterbody segment can have more than one cause of impairment.

## What Are The Main Pollutants Of Concern In The Basin?

**Monitored Causes.** In the Basin, the parameters that account for a majority of the monitored impairments listed in the 1998 303(d) List include pathogens and pH. These impairments affect waterbodies with designated uses of Contact Recreation, Secondary Contact Recreation, and Aquatic Life Support.

**Pathogens.** Pathogens are bacteria that may cause illness in humans. Pathogens occur in human and animal wastes and pose a threat to humans primarily through skin contact or ingestion. Fecal coliform is a bacterium that is used in the monitoring process to indicate the potential for exposure to pathogens. The Mississippi water quality standard for fecal coliform specifies the safe concentration of this bacterium.

The 1998 303(d) List identified 3 stream segments that were considered to be impaired due to pathogens. Potential sources for this impairment are attributed to wildlife, livestock production, and wastewater discharge.

<b>Monitored Waterbodies Impaired by Pathogens in the South Independent Basin</b>		
<b>Designated Use: Contact Recreation</b>		
<b>Waterbody</b>	<b>Support</b>	<b>Miles</b>
Bayou Pierre	Not	15
<b>Designated Use: Secondary Contact Recreation</b>		
<b>Waterbody</b>	<b>Support</b>	<b>Miles</b>
Homochitto River	Partially	16
Tangipahoa River	Partially	9

**pH.** Healthy aquatic systems exist in a relatively neutral range of pH. The acceptable range specified by Mississippi's water quality standards is 6.5 to 9.0. However, in some instances, the pH may be naturally below this range and the aquatic system remains healthy.

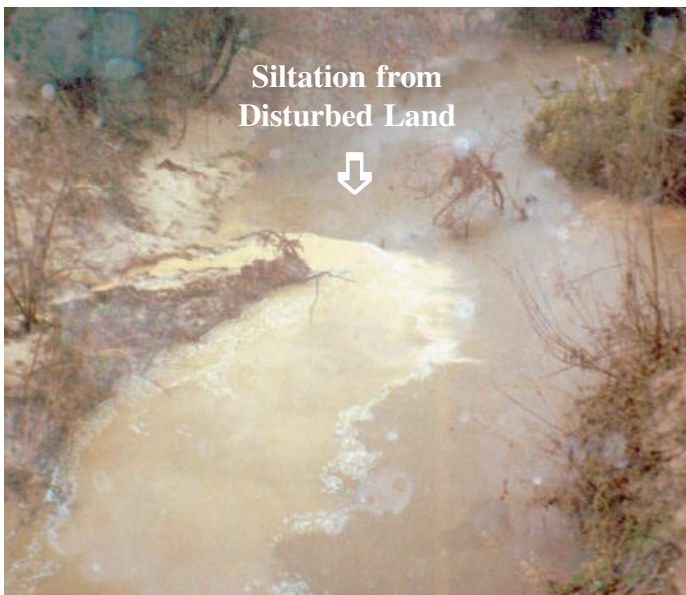
## ASSESSMENT OF RESOURCES

The 1998 303(d) List identified 2 waterbodies that were considered to be impaired due to low pH levels.

Monitored Waterbodies Impaired by pH in the South Independent Basin		
Designated Use: Aquatic Life Support		
Waterbody	Support	Miles
Bayou Pierre	Partially	15
Lake Hazel	---	---

**Evaluated Causes.** The four main pollutants identified by the evaluation process are siltation, nutrients, pesticides, and organic enrichment/low dissolved oxygen. These pollutants are known to have detrimental effects on aquatic life if existing in higher than recommended concentrations.

**Siltation.** Disturbance of lands adjacent to streambeds can significantly increase the loading of sand, silt, and clay to streambeds. This siltation reduces the available aquatic habitat and flow capacity of a stream, as well as increases siltation in downstream lakes and reservoirs.



Silt entering the stream from nearby land disturbance.

**Nutrients.** Elevated levels of nutrients can cause excessive growth of aquatic plant communities. Excessive growth of these plants, such as algae, can impair the growth of other life, deplete the dissolved oxygen in surface water, and cause eutrophication.

**Pesticides.** Excessive levels of pesticides can cause adverse effects on a number of aquatic species. Additionally, bioaccumulation of pesticides in fish can result in higher pesticide levels over time. Because many people in the basin rely on fish as a source of food, pesticide concentrations in fish and their potential related human health impacts are a significant concern.

**Organic Enrichment/Low Dissolved Oxygen.** Elevated levels of carbon-based materials and nutrients can cause significant depletion of dissolved oxygen concentrations in the water column through processes like nitrification of ammonia and carbonaceous decay. Aquatic life needs a minimum level of dissolved oxygen to sustain life. In Mississippi, this water quality standard has been designated as a minimum daily average of 5.0 mg/L, with an instantaneous minimum of 4.0 mg/L. Potential sources for this impairment are often attributed to agricultural practices and wastewater discharge.

**Fish Kills.** From January 1990 through December 1998, MDEQ investigated four fish kills in the South Independent Streams Basin. Of these, 3 were of unknown origin and 1 was related to low dissolved oxygen levels. By the time many of the kills were reported, the dead fish were deteriorated to the point that the cause was difficult to discern. In these situations, causes of the kills were categorized as unknown. Most of the fish kills attributed to low dissolved oxygen were natural occurrences in backwater areas.

**Groundwater.** Ground water contamination has not been a widespread problem throughout the South Independent Stream region, although a few localized contamination events have been attributed to leaky underground gasoline storage tanks. Analytical results obtained from sampling 36 shallow water wells as part of MDEQ's Agricultural Chemical Ground Water Monitoring Program and from testing the 178 regulated public water system wells indicate that the ground water quality in the region is quite good.

**Air Quality.** The ambient air quality in the South independent Streams Basin is in attainment with National Ambient Air Quality Standards (NAAQS) for carbon monoxide, ozone, nitrogen dioxide, particulate matter 10 microns or less (PM10), sulfur dioxide, and lead. Attainment status for fine particulate matter of 2.5 microns or less (PM2.5) is not currently known. Mississippi does not monitor for deposition of air pollutants in this basin region, therefore, the impact of air pollutants on water quality, if any, is not known.

# WATER QUALITY MANAGEMENT IN THE SOUTH INDEPENDENT STREAMS BASIN

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## What Programs Are Working to Improve Water Quality?

Numerous state and federal programs support the managed protection of the quality of Mississippi's waterbodies including regulatory programs that focus on permitting and compliance requirements, as well as voluntary management/assistance programs that encourage the implementation of management practices.

## State-Administered Regulatory Programs

A number of statewide regulatory programs work to protect and improve the quality of Mississippi's waterbodies. MDEQ is the lead agency for the State for a number of these programs that have been delegated from the U.S. Environmental Protection Agency. Additionally, MDEQ administers several regulatory programs required by state laws.

**National Pollutant Discharge Elimination System (NPDES).** The NPDES program issues permits to any facility discharging treated wastewater to state waters. These permits specify the types, quantity, and concentrations of pollutants that may be discharged by a facility.

**Other MDEQ Programs.** Additional permitting programs exist for a variety of activities, including the generation of hazardous wastes; the transportation, storage, and disposal of hazardous and non-hazardous wastes; underground storage tank installation and monitoring; concentrated animal feeding operations; air emissions; surface and ground water withdrawals; and surface mining operations. In addition, the agency reviews proposed projects that could potentially impact wetlands areas through the Water Quality Certification Program (also known as 401 Certification).

The issuance of permits necessitates monitoring and enforcement of permit requirements. MDEQ has an active permit compliance and enforcement program for all of the permitted activities described in the previous paragraph. To simplify the permitting process and ensure an effective compliance and enforcement program, MDEQ recently established separate permitting and compliance/enforcement divisions.

**Municipal Storm Water Management Program.** Polluted storm water runoff is often transported to municipal separate storm sewer systems (MS4s) and

ultimately discharged into local rivers and streams without treatment. EPA's Storm Water Phase II Rule establishes a MS4 storm water management program that is intended to improve the nation's water by reducing the quantity of pollutants that storm water picks up and carries into storm sewer systems during storm events.

What constitutes an MS4 is often misinterpreted and misunderstood. The term MS4 does not solely refer to municipally owned storm sewer systems, but rather is a term with a much broader application that can include, in addition to local jurisdictions, state departments of transportation, universities, local sewer districts, hospitals, military bases, and prisons. An MS4 is not always just a system of underground pipes - it can include roads with drainage systems, gutters and ditches.



Pollutants such as oil and grease from roadways, pesticides from lawns, sediment from construction sites and litter can runoff into storm water system.

Common pollutants include oil and grease from roadways, pesticides from lawns, sediment from construction sites, and carelessly discarded trash, such as cigarette butts, paper wrappers, and plastic bottles. When deposited into nearby waterways through a MS4, these pollutants can impair the waterways, thereby discouraging recreational use of the resource, contaminating drinking water supplies, and interfering with the habitat for fish, other aquatic organisms, and wildlife.

The 1987 amendments to the Clean Water Act mandated EPA develop a tiered implementation strategy for the NPDES Storm Water Program. The first phase of this approach (published on November 16, 1990) targeted storm water discharges associated with the most likely sources of wet weather pollution: medium and large MS4s and eleven categories of industrial activity including construction. These sources were required to apply for

# WATER QUALITY MANAGEMENT IN THE SOUTH INDEPENDENT STREAMS BASIN

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coverage under an NPDES storm water permit unless eligible for exemption. The second phase of this approach (published on December 8, 1999), covers: small MS4s, construction activity from 1-5 acres, and revision to the “no exposure” exclusion for industrial facilities.

The Storm Water Phase II regulations require operators of identified MS4s to obtain NPDES Permit coverage. The Environmental Permits Division of MDEQ will issue a General NPDES Storm Water Permits for these facilities. General permits prescribe one set of requirements for all applicable permittees. General permits are drafted and then published for public comment before being finalized and issued. A Notice of Intent (NOI) serves as the application for the general permit. The NOI must describe a storm water management plan, including best management practices (BMPs) and measurable goals. A Phase II applicant has the flexibility to develop an individualized storm water program that addresses the characteristics and needs of its system, provided the basic requirements of the general permit are satisfied.

**Development of Total Maximum Daily Loads (TMDLs).** MDEQ has implemented the basin planning process to help develop TMDLs. Several activities must be carried out during established phases of the basin management cycle in order to establish TMDLs that are scientifically based, technically sound, and acceptable to the public. Some of these activities include clarifying specific causes and sources of evaluated water quality impairments, developing predictive means (for example, water quality models) for establishing pollutant loading capacity, and setting point source and nonpoint source load allocations. The Basin Team will also seek stakeholders’ input at key points in the TMDL development process. These efforts will be needed for each of the monitored waterbody segments identified on the 303(d) List of Impaired Waterbodies in the South Independent Streams Basin.

**Confirming Impairment.** Significant numbers of stream segments were placed on the 1998 303(d) List as evaluated waters due to the lack of monitoring information. A major effort is underway to develop water quality information through biological assessments that will provide information necessary to confirm these listings. Additional information is required to gain a better understanding of the conditions and contaminants that caused the impairment.

**Evaluating BMPs.** Information from programs designed to evaluate the economic, management and environmental benefits of best management practices will support the decisions required to improve the water quality within the basin.

## State-Administered Management/ Assistance Programs

A number of state-administered management/ assistance programs exist in a variety of state agencies. Many of these are briefly described below. In an effort to continuously improve the effectiveness and efficiency of these management/assistance programs, coordination of these programs will be a focus of the Basin Management Approach.

**Mississippi Agricultural and Forestry Experiment Station (MAFES).** MAFES was established for the express purpose of conducting scientific research in agriculture, forestry and related sciences. The agency focuses on both basic and applied research. Program areas that MAFES actively pursues include environment and natural resources planning, new food and nutrition products research, analyses of economic and social issues, animal production systems research, and crop production systems research.

**Mississippi Department of Agriculture and Commerce (MDAC).** The Pesticide and Plant Protection Division is responsible for licensing pesticide applicators, as well as providing applicator training in conjunction with the Agricultural Extension Service. Technical assistance is also provided on a case-by-case basis to farmers experiencing pesticide application problems, plus to those needing assistance with the disposal of obsolete pesticides.

**Mississippi Department of Environmental Quality (MDEQ).** MDEQ manages several major water quality management programs that issue grants and low-interest loans and provide technical assistance to the public and municipal entities. These programs include the Section 319 Nonpoint Source Pollution Grant Program and the Comprehensive Multimedia Pollution Prevention Assistance Program.

The Section 319 program requires a forty percent non-federal match. Nonpoint source pollution is defined in general as pollution by diffuse sources that are not regulated as point sources and normally is associated with agriculture, forestry, urban runoff, and runoff from construction activities.

# WATER QUALITY MANAGEMENT IN THE SOUTH INDEPENDENT STREAMS BASIN

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The Comprehensive Multimedia Pollution Prevention Assistance Program is an outreach/assistance program that focuses on helping businesses to identify and reduce generated wastes and identifies and encourages recycling opportunities.

Several statewide financial assistance programs are available for funding potential water pollution abatement and drinking water system improvement projects. MDEQ operates the Water Pollution Control Revolving Loan Fund Program (WPCRLF), the Water Pollution Control Emergency Loan Fund Program (WPCELFL), and is contracted to the Mississippi Department of Health to administer both the Local Governments and Rural Water Systems Improvements and Emergency Revolving Fund Loan Programs. The WPCRLF has an average of \$26 million available each year; the WPCELFL has about \$3.3 million available; the Drinking Water Improvements Loan Fund provides about \$10 million each year; and the Drinking Water Emergency Loan Fund has about \$5 million to fund water pollution control and drinking water system construction projects, respectively. Other financial assistance programs include: MDA through its Community Development Block Grants (CDBG); Capital Improvements Revolving Loan programs, Energy Loans; Small Municipalities and Limited Population Counties Grant programs as well as other assorted loan programs from USDA Rural Development; and U.S. Dept. of Commerce, Economic Development Administration.

**Mississippi State Department of Health (MSDH).** The Bureau of Environmental Health, within MDH, has the responsibility of developing, implementing, and enforcing regulations pertaining to on-site wastewater disposal. County health officials are available to assist and inform the public regarding on-site wastewater requirements.

**Mississippi Department of Marine Resources (MDMR).** MDMR is dedicated to enhancing, protecting and conserving the marine resources of Mississippi for present and future generations. It manages all marine life, public trust wetlands, adjacent uplands and waterfront areas for the long-term recreational, educational, commercial and economic benefit of everyone.

**Mississippi Development Authority (MDA).** Through its programs and activities, MDA's Energy Division promotes the efficient and environmentally acceptable use of energy in all sectors of the State's economy. The Energy Division also encourages an environment that enhances the State's access to cost competitive, available energy resources, ultimately

benefiting economic development in Mississippi. These programs and services are funded by U. S. Department of Energy funds, oil overcharge restitution funds, and state funds. Staff members compile and analyze energy data, administer grant and loan programs, research policy initiatives, conduct energy audits, and support the development and application of alternative energy technologies.

**Mississippi Forestry Commission (MFC).** MFC provides technical assistance for state and federal programs relating to nonpoint source pollution from forestry activities. Major programs include the Federal Forestry Incentive Program, Agricultural Conservation Program, Reforestation of Timberlands Act, and Cooperative Forest Management Program. MFC, in cooperation with the U.S. Forest Service and the Mississippi Forestry Association, developed a set of best management practices for forestry activities, which is available to the public.

**Mississippi Soil and Water Conservation Commission (MSWCC).** MSWCC is designated as the management agency for agricultural nonpoint source pollution in the state. The agency provides educational programs and agricultural nonpoint source assessments and facilitates projects designed to demonstrate the effectiveness of implemented best management practices.

**Mississippi State University Cooperative Extension Service (MSU/CES).** The MSU Extension Service conducts outreach programs and facilitates demonstration projects designed to encourage the use of best management practices for erosion control and management of nutrients, pesticides, and animal wastes.

**Mississippi State University Water Resource Research Institute (MSU/WRRI).** Located on Mississippi State University's campus, WRRI administers and coordinates research programs dealing with water and related resources. WRRI is authorized by Section 104 of the Water Resources Research Act of 1984 and by Mississippi Code Annotated 57-55-7, as amended. Its activities are developed in close consultation and collaboration with leading water resources officials within the state. The Institute's purpose is to provide a coordinated research and development program that contributes to the solution of water related land use problems in Mississippi, the region, and the nation.

**Planning and Development Districts.** Ten Planning and Development Districts in Mississippi serve as regional planning organizations to serve local

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governments in their districts. The Southwest District Office, located in Natchez, provides technical and planning services to communities in 10 southwestern counties. The office also provides loans that promote the growth and development of the rural economy by assisting businesses with both start-up and expansion funding. Additionally, through various funding sources, the District provides grant administration services for both economic and community development as well as assisting communities with loans for public improvements. Some of the previously mentioned state agencies provide funding and expertise for a variety of projects with which the District is involved. Throughout the grant and loan administration, the District ensures that the projects receive proper review and approval from the appropriate environmental agencies and work closely with engineers to ensure that the projects are carried out according to approved plans.

**Resource Conservation and Development Councils.** Seven Resource Conservation and Development Council districts exist in Mississippi. These councils promote rural economic development. Projects include emergency work, establishing recreational areas, and erosion control. Activities of these councils are administered by NRCS.

**Soil and Water Conservation Districts.** Soil and Water Conservation Districts are established in each of the eighty-two counties of the state. The districts assist landowners and operators in developing and implementing soil erosion control and water conservation plans.

## Federally-Administered Management/Assistance Programs

A number of management/assistance programs also exist in a variety of federal agencies. In an effort to increase the effectiveness and efficiency of these management/assistance efforts, program coordination will be a focus of the Basin Management Approach. Brief descriptions of these programs follow.

**Agricultural Research Service (ARS).** ARS measures the impacts of farming and ranching practices and other processes on water quality. ARS also assesses processes that control the transport and fate of chemicals and other contaminants. Using this information, the agency develops effective alternative practices designed to protect and enhance water quality.

**Cooperative State Research, Education, and**

**Extension Service.** This federal program provides educational and technical assistance to farmers for voluntary implementation of improved management practices that enhance and protect water quality and for agricultural nonpoint source pollution problems.

**Natural Resources Conservation Service (NRCS).** NRCS provides a number of management/assistance programs. These programs include the Environmental Quality Incentives Program (EQIP) which provides technical, educational, and financial assistance to producers that face the most serious threats to soil, water, and related natural resources; the Watershed Protection and Flood Prevention Program which focuses on cooperation with other state and local agencies to plan and carry out work to improve soil conservation and for other purposes, such as flood prevention, conservation, development, and water utilization; and the Wetland Reserve Program (WRP) developed to protect, restore, and enhance the functions and values of wetland ecosystems.

Additional NRCS management/assistance programs include the Conservation Reserve Program (CRP) developed to cost-effectively reduce water and wind erosion, create and enhance wildlife habitat, and encourage more permanent conservation practices and tree planting and the Emergency Conservation Program designed to rehabilitate farm land damaged by natural disasters and to carry out emergency water conservation measures during periods of severe drought.

**U.S. Fish and Wildlife Service (USFWS).** USFWS provides a number of management/assistance programs that include the Partners for Fish and Wildlife Program that restores habitat for federal trust species through voluntary agreements with private landowners and the Off-Refuge and On-Refuge Investigation Programs that are designed to protect and enhance the quality of habitat and environment for fish and wildlife in and near National Wildlife Refuges.

**U.S. Forest Service (USFS).** In cooperation with the Mississippi Forestry Commission and the Mississippi Forestry Association, this federal agency assists in the development of a set of best management practices for forestry activities, which is available to the public.

**U.S. Geological Survey (USGS).** USGS works to identify the status and trends in water quality conditions and the human and natural conditions that cause existing water quality problems and communicates these findings to resource managers and policy-makers.

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## Identifying, Evaluating, and Addressing Issues of Concern Through the Basin Management Approach

A major endeavor of the Basin Management Approach process is the identification, evaluation, and prioritization of issues of concern within a basin. The ultimate goal is the development of a basin management plan designed to address the prioritized and quantified (through data collection and assessment) issues of concern. Prioritized issues of concern within the South Independent Streams Basin were identified by basin stakeholders and resource agency partners.

**Identification, Evaluation, and Prioritization of Issues.** All of the identified issues will be reviewed and evaluated to ensure that an adequate description was developed, to determine if data are available to assess them, and to establish a relative ranking of priority for each issue based upon its potential impact on water quality and public health.

Issues of concern in the basin include, but are not limited to:

- \* Water quality impacts from turbidity and suspended sediments
- \* Unsewered communities and/or failing septic systems
- \* Habitat loss
- \* Management of erosion, sediment control, nutrient, pesticide, and storm water in urban areas
- \* Illegal dumping

**Data Collection Plan Development.** The next major milestone for the South Independent Streams Basin Team will be the preparation and implementation of a Data Collection Plan to evaluate the priority basin issues of concern. For each priority issue, the Data Collection Plan will identify what information is needed and why, who will collect the information, by what means and methods, over what period of time, and how the information will be stored and managed. A primary use of the Data Collection Plan will be to provide a central point of reference for all basin planning partners, as well as the public. This should

help to improve the coordination and efficiency of data collection and evaluation.

**Stakeholder Involvement.** A basin stakeholder is a person who lives or works in the basin, recreates on its waters, or has an interest in the basin. The Basin Team will work with stakeholders in the South Independent Streams Basin through each phase of the basin management cycle. The Basin Team will seek both resource agency and stakeholder input on development of a Data Collection Plan that is needed to guide data collection efforts to address the priority basin issues of concern. Stakeholders will also be given the opportunity to help gather appropriate information during the data collection process and will be informed of data collection results once the Basin Team has evaluated the information.

During the basin management plan development phase, stakeholder input will be solicited and assistance requested for the identification of management strategies. Technical assistance will be provided by the Basin Team. When completed, public meetings will be held to review the plans and obtain additional public input. Finally, during implementation of the basin management plan, stakeholders will be encouraged to actively participate in outreach and implementation activities.

## What You Can Do To Help

Steady progress is being made in solving water quality problems in the South Independent Streams Basin. However, we all need to do more to protect our water resources for future generations.



Couch and other waste debris dumped in streambed. Open dumping of solid waste continues to be a basin-wide issue.

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**Properly dispose of wastes.** Do not accept the illegal dumping of non-toxic and toxic wastes in your community as a way of life. Non-toxic wastes include household garbage and inert debris like stumps and concrete. Toxic wastes include solvents, paints, oil, pesticides, and many cleaning agents. Encourage those in your community to find out the locations of non-toxic waste collection facilities and free collection days where you can bring in toxic materials for disposal.

**Use Best Management Practices.** Many management practices have been developed and proven to reduce pollution of our water resources. Many of our resource agencies have programs designed to help the public learn about appropriate management practices for a range of land uses. Contact them: they will be glad to help.

**Conserve water-inside and out.** By conserving the amount of water we use, we reduce the amount that must be treated and discharged. This reduction in demand also places less stress on our ground waters aquifers and help to maintain stream levels.

**Public Involvement and Participation.** Because public involvement is a cornerstone of the Basin Management Approach, your participation and support are essential to meet the goals and objectives of the process. There are a number of things that you can do:



Public concerns and input are gathered during public stakeholders meeting.

**Get informed.** Attend stakeholder meetings and actively participate. Find out about your local water resource problems. A database for basin stakeholders has been established for mailing information about meetings and other Basin Management Approach activities in the South Independent Streams Basin.

**Get involved.** Join or form a local watershed group. A key element of the Basin Management Approach is the formation of local watershed groups to assist in planning, monitoring, and implementation activities. This is an opportunity for you to make a difference.

## Who Can You Contact To Learn More?

If you or your organization would like assistance with forming a local watershed group or notification of upcoming stakeholder meetings or simply desire information concerning the South Independent Streams Basin Management Approach, please contact the following person:

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